

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

VOL. XCVIII. — THURSDAY, APRIL 11, 1878. — NO. 15.

SUBPERIOSTEAL EXCISION OF THE ENTIRE SCAPULA AND HEAD OF THE HUMERUS: RECOVERY.

BY CHARLES B. BRIGHAM, M. D., SAN FRANCISCO.

MAURICE KAHN, aged thirty-five, single. In March, 1877, the patient had what he supposed was an attack of rheumatism in the right shoulder; a gland in the right axilla became swollen and painful, but did not suppurate. Under medical treatment two small incisions were made over the acromion process, and considerable pus was evacuated. The patient's condition did not improve, and he entered the County Hospital at Los Angeles, where he stayed three months; during this time abscess after abscess opened spontaneously. The patient entered the French Hospital at San Francisco on the 15th of October, and was placed in my service. At that time there were fourteen fistulous openings, all leading to dead bone. There was no positive history of specific disease; the patient had received a severe blow on the affected shoulder several years before, but it is doubtful if this had anything to do with his present condition. The suppuration was profuse. A liberal allowance of food was ordered, and a tonic containing iodide of potash; bran baths were given daily. An operation was advised, and the patient agreed to have all the dead bone removed. Accordingly, on the 23d of October, 1877, he was etherized, Dr. William S. Whitwell assisting. An incision four inches in length was made from a point half-way between the coracoid process and the acromion. Everything was divided down to the bone; the head of the humerus was exposed without difficulty, and removed at the surgical neck by a chain saw; no vessels were tied. The bottom of the wound was then explored by the finger, and the glenoid cavity was found to be extensively diseased. The finger was then passed into a fistulous opening near the acromion and carried along the spine of the scapula; this part also was found necrosed throughout. As far as the finger could reach along the dorsum dead bone could be felt. It was then decided to remove the entire scapula, the glenoid cavity, the spine, and the outer surface being necrosed. An incision seven inches in length was made along the spine of the scapula; this extended over the shoulder about an inch and a half from and par-

allel to the incision made for removing the head of the humerus. The periosteum scraper and the fingers alone were used to free the scapula from its surrounding muscles. Dissecting from the spine downwards, the deltoid and infraspinatus muscles were freed from the bone without much difficulty. The origin of the teres major was reached by passing the finger through a fistulous opening over the inferior angle. When all the outer surface of the bone below the spine was free attention was given to the supraspinous fossa; to separate the muscular attachments of this region was the most arduous part of the operation. When the coracoid process was free a strip of linen was passed around its base, including also the acromion, and the whole bone was tilted upwards and outwards; the inner surface was slowly reached; the subscapularis muscle was easily detached; the insertion of the serratus magnus was freed by the periosteum scraper. The bone came away entire, and quite free from periosteum; one small superficial vessel was tied; the hæmorrhage was very slight, owing to the exclusive use of the fingers and periosteum scraper. The operation lasted an hour and a half. Four sutures united the edges of the incision. A rubber drainage tube was passed from the line of the incision to the fistulous opening below the locality formerly occupied by the inferior angle of the scapula. A drainage tube was also placed in the wound made for the excision of the head of the humerus; two sutures united the edges of this wound. The dressing consisted of charpie soaked in carbolized glycerine, over which was placed a thick layer of cotton-wool, which enveloped half the body.

The patient rallied well from the operation; in the evening, pulse 120, temperature 37.5° C.; there was no pain of any account. The patient was quite cheerful.

October 24th. Pulse 108; temperature 37°. Patient perspiring freely; fed on beef tea and iced milk; tongue coated. Evening, pulse 120; temperature 38°. Slept at intervals during the day.

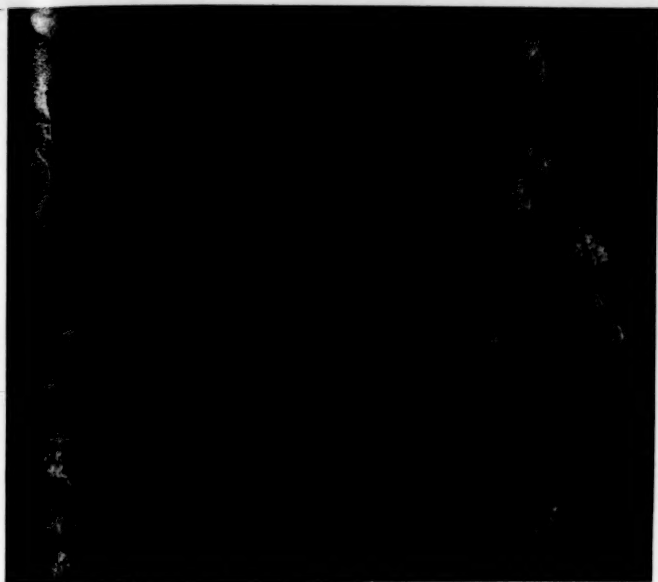
October 25th. Pulse 108; temperature 37.5°. Evening, pulse 120; temperature 37°. Patient takes ten grains of quinine during the day, and half a grain of morphine during the night.

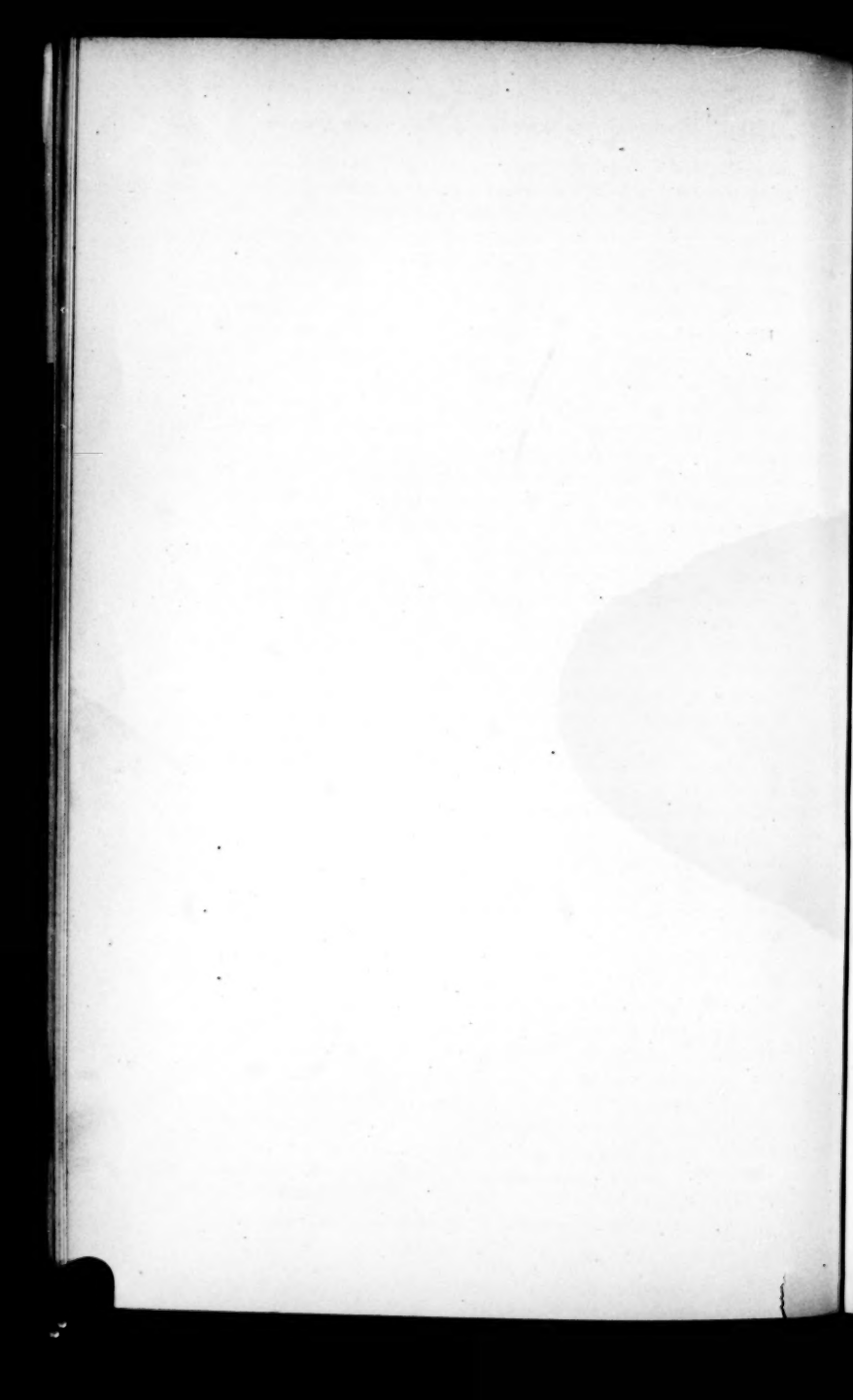
October 26th. Pulse 100; temperature 37°. Slept about three hours last night. The dressings were removed for the first time; there was a bloody discharge from both tubes. Where the sutures were placed in both wounds there was union by first intention.

October 27th. Pulse 100; temperature 36.5°. Dressing again changed; suppuration moderate and bloody.

October 28th. Pulse 108; temperature 37°. Evening, pulse 110; temperature 37°. Patient quite feverish.

October 29th. Pulse 96; temperature 37° Patient feels much better and quite hungry.





October 30th. Pulse 96; temperature 37°. Suppuration very free. There is no swelling of the arm, fore-arm, or hand; the sides of the large incision are without any redness whatever.

October 31st. Pulse 96; temperature 36.5°. All the sutures were removed; except where the drainage tubes were placed the wounds had united by first intention. Patient had a troublesome diarrhoea, which was arrested by a mixture of camphor, opium, and rhubarb.

November 1st. Pulse 96; temperature 37°. A poultice was placed over the wound on account of a diminished suppuration. The whole shoulder is washed daily in soap-suds.

November 2d. Pulse 96; temperature 37°. Patient improving daily in general health. The pus collects at the lower part of the scapula wound in spite of the drainage tube.

November 3d. The patient feels as if he could get out of bed and walk; is hungry all the time. The wound begins to sink in.

November 4th. Pulse 96; temperature 36.5°. A small incision was made at the lower part of the wound where the pus collected; into this opening a piece of drainage tube two inches in length was inserted.

November 5th. Pulse 84; temperature 37°. The drainage is now complete.

November 6th. The patient sits without fatigue; the back is perfectly smooth; the absence of the scapula is hardly noticed.

November 7th. The arm and fore-arm for the first time are somewhat swollen; the suppuration of the smaller wound is much diminished.

November 8th. Patient sat up all day. The arm remains swollen, as well as the feet and scrotum. Digitalis and cream of tartar tea were given, as the urine was scanty.

November 9th. Urine more abundant. Both legs are bandaged. Patient insists upon getting up daily.

November 13th. An old fistulous opening near the middle of the arm reopened and discharged freely; from this time the swelling in the arm diminished.

November 20th. All bandages removed from the legs. The suppuration is very moderate, and is encouraged by poultices. From this date the patient walked out-of-doors daily; small bits of necrosed bone came away from time to time. The improvement in general health is remarkable. Poultices of flaxseed meal smeared with cosmoline and covered with cotton-wool were used as dressing until January 1st, when the suppuration having nearly ceased cosmoline alone was applied. The deformity of the shoulder cannot be detected when the dressing of cotton wool is used; when undressed the deformity is but slight, as is seen in the heliotype. As to movement, the patient can already put his right hand to his left shoulder unassisted; he can move his arm

backwards and forwards an inch in each direction ; and has full use of the right hand in writing, eating, and in all the ordinary movements. He purposely gives the limb all the gentle exercise possible, such as carrying light weights, playing cards, etc.

The appearance of the excised bones is as follows : the head of the humerus is rough and bare, with a small portion of ossified cartilage adherent to it ; its spherical appearance is preserved ; the greater tuberosity is necrosed and jagged ; the shaft is healthy. The scapula is necrosed throughout and much thickened ; the coracoid process is reduced to a thick, straight stump ; the spine is nearly destroyed, but still supports a tapering acromion. At the lower end of the spine two sinuses as large as a quill traverse the bone ; lower down, near the middle of the posterior border, is another sinus, very round, and passing through the bone obliquely. The posterior border is uneven and notched ; the inferior angle is much thickened ; the inferior border shows several projecting spiculæ of bone ; the glenoid cavity is completely destroyed. The inner surface of the bone is rough and thick ; the three sinuses are visible ; the bone is transparent only at one point near the centre ; there is a building up of bone below the coracoid process. Seven small pieces of bone belonging to the spine of the scapula came away during the operation.

The operation of excision of the shoulder blade is interesting for several reasons, namely, from its rarity, there having been but comparatively few such operations performed ; from its magnitude, the scapula being the largest flat bone in the body, imbedded deeply in strong muscles ; from the possibility of removing the diseased shoulder blade while saving the healthy arm, the operation being, as Sir William Fergusson said, "*the ne plus ultra* of conservative surgery." The operation by a single incision along the spine is believed to be without precedent.

Mr. James Syme, one of the first (Professor Langenbeck was the first) to perform excision of the scapula while saving the healthy arm, published the following conclusions : —

- (1.) That the entire scapula, either alone or together with the arm, may be removed without much difficulty or loss of blood.
- (2.) That the wound thus inflicted may heal quickly and soundly.
- (3.) That the arm if preserved may be strong and useful.

LECTURES.

ON THE PHYSIOLOGY OF THE SPINAL CORD.

DELIVERED AT THE COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK,
BY PROF. JOHN C. DALTON.

[REPORTED BY F. BRYNBERG PORTER, M. D.]

III.

CROSSED ACTION AND REFLEX ACTION OF THE SPINAL CORD.

GENTLEMEN, — In the spinal cord the paths for the transmission of motor impulses are known as its motor tracts, and those for sensitive impulses as its sensory tracts, and we shall now endeavor to follow the course of these tracts more perfectly. In doing this we shall find that hitherto, in our study of the cord as a medium for the transmission of impulses, we have left unnoticed one important fact, that is, the fact of its crossed action. The spinal cord, as a medium for voluntary motion and conscious sensation, exerts a crossed action. A tactile impression made upon the integument of the right side of the body is conducted by the sensory tracts of the spinal cord to the left side of the brain, and an impression made upon the left side of the body is conveyed to the right side of the brain. In the same way there is a similar cross-action in regard to movement, so that when the right arm, for instance, is raised, the stimulus for this action comes from the left side of the brain, and *vice versa*. How do we know this? In the first place by experiments upon animals, and, secondly, by the observation of morbid effects in the human subject. I have often seen a galvanic stimulus, applied to one side of the brain in the dog, produce local movements on the opposite side of the body; and this crossed action of the cord is universally recognized as a pathological fact in connection with various forms of paralysis and other affections of the nervous system.

We come next to inquire, What are the details of this action; how and where do the fibres which conduct motor and sensitive impressions cross each other? Examination of the anatomy of the parts shows that the motor tracts cross each other, not in the cord itself, but in the medulla oblongata, which, as you know, is the enlargement of the cord just above its entrance into the cranial cavity. In that part of the medulla are the *anterior pyramids*, extending upward from the foramen magnum to the lower border of the pons Varolii; and here an interchange takes place of the motor fibres coming from the two sides of the cord. The decussating fibres are derived mainly from the lateral columns of the cord, which preponderate in size over the anterior columns as they approach the medulla oblongata. They cross each other, at the median line, in bundles of considerable size, passing obliquely upward to form

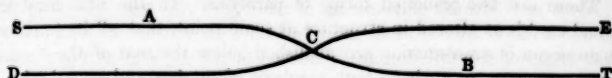
the two anterior pyramids. This decussation of the pyramids, as it is called, is easily visible, not only in man, but in many of the lower animals. In this enlarged model you see what and where the decussation is. Above the anterior pyramids their fibres are continued, through the substance of the pons Varolii, to the crura cerebri, and finally lose themselves in the brain. After passing into the cranial cavity, therefore, the motor tracts may be followed into the medulla oblongata, through the pons Varolii, and, still higher, into and through the crura cerebri.

Now, how do we know that the medulla oblongata is the point where the decussation of the motor fibres takes place? This is very simply determined. An injury inflicted upon the motor tracts above this point causes convulsions or paralysis on the opposite side of the body; while if the seat of the injury be below the medulla, its effect is produced upon the same side of the body. If we divide one lateral half of the spinal cord, a paralysis of motion will be produced, limited to the portion of the body below the level of the section, and confined to the same side. Thus, if one side of the cord be divided by a horizontal section in the middle of the back, the posterior extremity of the same side will be paralyzed. On the other hand, if we divide one of the crura cerebri we shall produce a paralysis of both the anterior and posterior limb on the opposite side of the body.

Now, is it possible to paralyze both sides of the body at once by any operation about the medulla oblongata? This may be done by a longitudinal incision through the medulla in the median line. In this diagram of the spinal cord, medulla oblongata, and brain, you see the fibres of the motor tract on each side delineated in blue, and those of the sensory tract in red. You observe that the motor tracts cross each other at the anterior pyramids, so that the fibres which originate in the right side of the brain pass over to the left side of the cord at this point, and *vice versa*. This shows, therefore, how it is that an injury to the left side of the brain will produce a paralysis of motion on the opposite side of the body; for, owing to the anatomical arrangement of the motor tracts, this must necessarily be the case. After death, in cases of unilateral paralysis, the autopsy usually reveals a cerebral lesion on the opposite side of the brain, most frequently in the corpus striatum or its immediate vicinity. On the other hand, an injury or pathological condition confined to one side of the spinal cord produces a paralysis of motion on the same side of the body.

We come now to the experiment of destroying the power of voluntary motion on both sides of the body at a single stroke. In order to do this we need not disturb the cerebrum at all, but, as I mentioned a few minutes ago, we have only to make a longitudinal section of the medulla oblongata in the median line, which, of course, passes through

the decussation of the motor tracts. Such a bilateral paralysis, affecting all the four limbs at once, may be the result of either injury or disease, though disease of the medulla oblongata is much more rare than of the brain proper. This condition may be illustrated by a diagram representing two railroads crossing each other at an acute angle.



If there be an obstruction at any point, as at A or B between the starting-point S and the terminus T, on the same road, it will interrupt travel only on that road. But if the obstruction be located at the point C, where the two roads cross, travel will be interrupted on both roads at the same time. If we bear in mind these anatomical features of the spinal cord and medulla, almost every variety of unilateral or bilateral paralysis may be accounted for. Most forms of paralysis, as met with in practice, are simple in character. An injury or disease of the medulla oblongata is usually soon fatal, so that the compound paralysees due to this cause do not often come under the notice of the physician; or, if they do, they are accompanied by other symptoms more distressing and important in character.

Next, let us see what is the course of the sensory tracts. We find that there is a decussation of the sensitive fibres in the cerebro-spinal axis as well as of the motor fibres, but in the case of the sensitive fibres this decussation does not take place altogether at the anterior pyramids of the medulla. It occurs, on the contrary, all the way down the spinal cord, the sensitive fibres crossing each other throughout its entire length. The proof of this is that after a section of one lateral half of the cord, while voluntary motion is destroyed in the parts below the injury on the same side, sensation is destroyed in the corresponding parts on the opposite side. In fact, after such an operation, sensation on the same side is considerably increased in intensity. This result is explained by the fact that an injury inflicted on any part of a nervous centre not infrequently exerts an indirect influence upon its neighboring parts. The gray matter of the spinal cord is the channel for the transmission of sensations, and its irritability is no doubt increased by such a section. The continuous decussation of the sensitive fibres of the cord was first demonstrated by Brown-Séquard, and I have myself verified his results.

What bearing have these facts on the study of diseased action? Yesterday I alluded to some of the early symptoms of spinal meningitis due to irritation of the anterior or posterior columns of the cord. After such an inflammation has proceeded far enough to cause softening of the cord, or pressure by effusion, we have as a consequence loss of both

motion and sensibility in the parts below. Strictly speaking, the term paralysis means only a loss of voluntary motion, while anæsthesia means the loss of ordinary sensation; although in common parlance we usually include both loss of motion and loss of sensibility under the single term paralysis.

There are two principal forms of paralysis. In the first kind the spinal cord is so altered in structure at some point, that all its functions as an organ of transmission are abolished below the seat of the disease. As a consequence, we have both paralysis of motion and anæsthesia, in all the lower region of the body. This sort of paralysis is known as *paraplegia*. It is almost always complete when it exists at all, and is due to injury or disease above the origin of the lumbar nerves. If the lesion is at a higher level, it also affects the muscles and skin of the abdomen and back, or even of the chest; and if higher still, the upper extremities are included in the paralysis. In point of fact, however, we seldom meet with a paralysis affecting all four limbs at once; because in that case the lesion is almost certain to interfere with the phrenic nerve, and thus become so rapidly fatal that there is not much opportunity for pathological or physiological observation.

The second form of paralysis is that confined to one lateral half of the body. There is a unilateral paralysis of both the upper and the lower extremity, and the median line is the limit for the loss of sensibility. A quarter of an inch from this line on the affected side the prick of a pin may not be felt at all, while at the same distance from the median line on the unparalyzed side sensation may be entirely normal. This kind of paralysis is known as *hemiplegia*, a name indicating that the disease affects one of two symmetrical halves. When paraplegia is present, we know that it must be due to some injury or affection of the spinal cord; and in hemiplegia it is also possible that the lesion may be situated in the cord, the trouble, whatever may be its nature, being confined to one lateral half of the organ. But since the horizontal dimensions of the cord are so small, it is improbable that any disease or mechanical injury should be entirely limited to one side. Even in physiological experiments, where the cord is exposed to view, it is difficult in making a hemi-section to avoid crossing in some degree the median line. Hemiplegia, therefore, from disease or injury of the cord must be quite rare. Practically, it is almost always due to some affection of the brain. The subject of paraplegia and hemiplegia is an exceedingly interesting one from both a physiological and a pathological point of view; but with these considerations I must dismiss it, leaving its more ample treatment to another department.

We have now finished the investigation of the spinal cord, regarded as a medium of communication between the brain and the external organs. Viewed in this light it is, in effect, a great nerve, by means of

which impressions are conveyed to and from the brain. But this is by no means its only function, nor, indeed, its most important one. The cord is composed of both gray and white matter, and is, therefore, a nerve centre as well as an organ of transmission. By virtue of the gray substance contained within it, it has the power of receiving and originating impressions, as well as of transmitting them. The brain is the seat of consciousness and volition; but without this organ it can be shown, experimentally, that the power of motion still remains, and that an impression made upon the integument is still capable of producing a reaction in the body and limbs through the agency of the spinal cord.

You see here three frogs, whose heads have been removed for periods of time ranging from three quarters of an hour to twelve hours. All consciousness has been destroyed by this mutilation, and yet the animals remain sitting in their natural attitude, very much as if consciousness were still present. Though the brain be absent, the animals are still capable of receiving impressions and of being affected by these impressions, as well as of executing movements in consequence of them, — all without any consciousness or active volition on their part. With a pair of forceps I now carefully lift one of the frogs, grasping it by the upper edge of the decapitated body. In the first place, you notice that the hind legs, which were before drawn up under the body in the natural position of a sitting frog, immediately hang downward when I lift the animal up. Why is this? Because there is now no hard surface in contact with the abdomen, to make an impression upon its sensitive integument. When I put the animal back upon the plate, you observe that the limbs are instantly drawn up again beneath the body. This is due to the contraction of their flexor muscles, excited by a sensitive impression on the cutaneous nerves. Now, holding the animal up again in the same manner as before, with both legs hanging loosely downward, I pinch one of the hind feet, when, you see, a contraction of the whole limb at once takes place; yet there is absolutely no consciousness or volition concerned in this movement. It is a sort of mechanical action, more simple in character than when the brain also takes part in its production. On withdrawing the stimulus, the movement ceases as instantaneously as it was excited.

In this case, we have evidently the action of a nervous centre. The function of a nervous centre is to receive impressions through the sensitive nerve fibres from the periphery, and to send out in return a stimulus through the motor fibres to the muscles. Voluntary motion requires a conscious mental operation, but involuntary movements are produced without it. What are the organs that react in this instance when I pinch the frog's foot? They are muscles of the animal's thigh. Yet I do not directly stimulate these muscles, but only touch the integument of the foot; and therefore there must be some active nervous communication between the sensitive integument and the contractile muscles.

This nervous action is of a threefold character: —

In the first place, it is not spontaneous, being excited only by the application of an external stimulus.

Secondly, it includes the action of two sets of nerve fibres, — the sensitive fibres distributed to the integument, and the motor fibres distributed to the muscles.

Thirdly, it is indirect or circuitous; that is, it does not pass directly from the integument to the muscles, but goes by some intermediate channel. In point of fact, the spinal cord is the means of communication. A sensitive impression is conveyed inward along the sensitive fibres, from the integument of the foot to the gray matter of the cord, and thence an impulse is transmitted outward through the motor fibres to the muscles of the thigh. It is only after an impression has been transmitted from without inward to the cord, and from within outward, — from the cord to the muscles, — that the muscular contraction is produced.

Let us next ascertain what will be the result of cutting off the communication between the spinal cord and the thigh. In order to do this I open the abdomen and uncover the lumbar nerves, which supply the lower extremities, as they issue from the spinal column in this region. You see these nerves exposed on both sides of the median line, and I now divide them on the left side, thus cutting off the nervous communications of that limb. When I hold up the animal again, both limbs hang down motionless, but on the right side pinching the foot causes contraction of the thigh as promptly as before, while on the left side, where the nerves have been cut, there is absolutely no reaction. I might apply any stimulus, such as fire, strong acids, or caustic alkalies, to this foot, and there would be no muscular action produced.

The last point to be investigated is the effect of destroying the spinal cord itself, while the sciatic nerve is left intact. I will therefore break up the substance of the cord with a steel needle introduced into the spinal canal. While this is being done, you notice active convulsive movements in the right limb, produced by the irritation of the nervous centre, but this ceases in a few seconds. I now pinch the integument of the feet as before, but there is no movement excited in either limb.

In this way we find that the active nervous centre in these cases is the spinal cord, and that the reflex action observed is due to it. The phenomena of reflex nervous action were first studied in the spinal cord, and are most familiar to us in connection with this organ. Reflex action is therefore sometimes spoken of as if it were exclusively an endowment of the spinal cord. But that is not really the case, and we have met with it first in connection with this organ simply because we have taken up the subject of the cord before that of the brain in our course. It is well to remember, however, that the reflex action of

the spinal cord is less complicated than that of the brain, or of most other parts of the nervous system. We see in the effect produced by pinching the integument of the foot of a decapitated frog the simplest form of reflex action, unaccompanied by any other nervous phenomena. We do not as yet know, and it seems to me doubtful whether we shall ever know, what is the exact nature of the change which takes place in the cells of the gray matter in reflex action. It would appear, however, that the gray matter is excited by the external sensitive stimulus to some special activity, from which the stimulus to muscular activity is in turn produced. In the next lecture I shall endeavor to complete our consideration of the functions of the spinal cord.

THE SO-CALLED "WEST END HORROR."¹

BY F. A. HARRIS, M. D.

THE case of Elizabeth Harmon, the young girl who was supposed to have come to her death in consequence of continued and unusually severe treatment at the hands of her self-constituted guardian, is interesting from its exposition of the way physical appearances are apt to be misinterpreted by the laity, especially when viewed in the light of prejudice or in connection with overt acts.

The first reports of this case indicated a shocking barbarity on the part of the woman. The child was said to have been beaten often and unmercifully with a club until she was covered with bruises; it was stated that she was held under a faucet till nearly drowned, and then sent reeling across the room with a heavy blow of the fist; that the woman had cut off the child's fingers with a table-knife; that she had torn off an ear, and pinned it on with a hair-pin; that she pulled out her hair by the handful; that the child's body was covered with scars, the results of her ill treatment; and so on, *ad infinitum*. The child, when seen by me, was laid out in the bedroom of the guardian with neatness, though cheaply; there were numerous scars on the head and body, and she was much emaciated. The inspection and section showed the condition of things to be, in brief, as follows: general emaciation; scalp in many places destitute of hair, which in general was short, dry, brittle, and with the slightest force easily to be pulled out; over the occipital region and elsewhere to a smaller extent the scalp was infiltrated, purple in color, and on it here and there were crusts of dried pus and blood; in the frontal region were two fluctuating tumors, whose contents were a greenish pus. On the right arm, at the outer border of the biceps muscle, was an excavation clearly marked, as though made by a punch, extending to the muscle, and of the size of

¹ Reported to the Massachusetts Medico-Legal Society.

a nickel five-cent piece. On the back and chest were a very large number of brownish discolorations, with loss of substance, many of these spots being horse-shoe shaped; on the posterior surface of the right thigh and on the left buttock were shallow, widely extending abscesses, where a probe could be passed beneath the undermined skin to a varying distance of from one to three inches. Now these appearances, clearly the result of constitutional disease, easily conveyed to the minds of the neighbors the idea of scars from brutality.

Aside from these appearances there was a scar on the outer border of the right ear, in line with it, one inch long, shallow, and covered with court-plaster, the result of no very serious wound; there was a loss of substance of the left ear, the result of disease or injury a long time ago. A loss of a portion of the distal phalanx of the index finger of the right hand, a recent affair, and a red scar on the right side of the throat, as if caused by a burn, were noticed. The woman claimed that this was the result of a blister which she had applied for sore throat, and the scar certainly might have been made in that way. There were no marks of injury from beating or other violence aside from those mentioned, and we are left with a scratch on the ear and a lost end of a finger. The section showed double pneumonia, with pleurisy of right side, and an abscess, the contents of which exuded from the nostrils on turning the body, which abscess was deeply seated in the region of the pharynx close to the spinal column, opening into the œsophagus on a level with the thyroid cartilage, and burrowing down the posterior mediastinum one inch below the notch of the sternum. There were other pathological changes not necessary to mention here, as the above lesions were the evident cause of death.

Now, to secure a verdict of manslaughter it was necessary to connect the ill-usage or exposure to which the child was said to have been subjected with the immediate cause of death. It was in evidence that the child had been kept up to assist the woman at a late hour at night; that she was obliged to rise very early in the morning to build the fires; that she had poor and insufficient food; that she had been sent out in her bare feet to wash the front steps in November; that the guardian, on the child's manifesting a reluctance to bathe, held her head under the faucet for a short time; that the child had been heard to scream as if being beaten, and that the woman had struck her with a stick the size of a finger; yet the time of such exposure to cold could not be so closely connected with the acute disease of which the child died as to warrant a verdict of manslaughter. The facts undoubtedly were, as shown by the testimony of all parties, including the guardian herself, that this woman, naturally destitute of finer feeling, and of a cold, hard nature, had taken the child from the poor-house, thinking that she would be of assistance to her. She had at first treated her well, but

finding that she was suffering from a loathsome disease, and that she had acquired habits of uncleanness, had resorted to harsh measures to induce the child to improve in this respect; that she had not appreciated the effects of this disease upon the constitution of the child, and had required altogether too much work of her, and had not given her the nourishment she needed. That the child had been deprived of the good clothes with which she was provided when she came to this city may as fairly be attributed to the constant soiling they were exposed to from the condition of the child's body as to a desire to torture. This fact was also shown; that the woman summoned medical aid when she saw the child was seriously ill, and when advised to take her to the City Hospital did so, and that the girl was not left there was solely due to the disturbance which the patient herself made, crying and begging not to be taken away from her "mother." On the whole, I think the fair conclusion is that the evidence furnished by the medical examination was far more corroborative of the charge of assault, on which the woman was convicted and received sentence, than of the more weighty charge of manslaughter which was originally made.

RECENT PROGRESS IN OPHTHALMOLOGY.

BY O. F. WADSWORTH, M. D.

Prevalence of Color-Blindness. — The methods contrived by Donders and Holmgren for discovering color-blindness, and the results of their application, have shown very conclusively the prevalence of this defect. And the fact that the defect was found in a considerable proportion of men in whom it could hardly have been suspected — in railroad employees — illustrates also the great importance of examination of men thus employed in regard to this quality of their vision. There have, indeed, for more than twenty years been published from time to time the results of examination as to color-blindness of pretty large numbers of individuals; but, though the percentage of color-blindness given has been in some instances enormous, the methods of examination employed have been in general so unsatisfactory and contained in themselves so many possible sources of error that the common belief, even among those who might be supposed best qualified to judge, has been that the defect was on the whole very infrequent.

Donders¹ undertook his investigations to determine what requirements ought to be made of railroad employees as to their ability to distinguish signals. These signals consist in Holland, as here, chiefly of white, red, and green flags by day, red and green lanterns by night. His method is based on principles similar to those which govern the

¹ Archiv für Ophthalmologie, xxiii. 4.

usual tests for acuteness of vision, and it admits of a numerical statement of the degree of acuteness of perception of any color as compared with the norm.

The tests by reflected light are made by fastening round pieces of colored, unglazed paper, or similar pieces of colored cloth of 1, 2.5, or more mm. diameter, upon black velvet, and determining the distance at which the color can be correctly made out. In general, with good light, bright, saturated colors of one mm. diameter can be distinguished by the normal eye at a distance of five metres. But the amount of illumination exercises a much greater influence on the distance at which the color of a given piece of paper or cloth can be told than it does on the distance at which the ordinary black test-letters can be read. It is therefore advisable that the observer determine at the time of each examination the distance at which his own normal eye perceives the colors.

The tests for transmitted light are made in a dark room by means of colored glasses placed against openings of variable size in a screen and uniformly illuminated from behind. Here, too, the size of the opening and the distance at which the observer distinguishes the color give the grade of his color perception when compared with the achievement of a normal eye.

By this method some two thousand three hundred persons, the employees of the Holland railways, were examined, and at the same time the refraction and acuteness of vision were determined for each eye separately. One hundred and fifty-two individuals were found whose perception of red and green was much less than normal, and whose serviceability was therefore doubtful. These, for the sake of greater security, were reexamined. Many of them asserted that their vision would prove better if tried in the open air. Fourteen of them were therefore selected and proved by the ordinary railway signals, both by daylight and at night, but this final test only confirmed the accuracy of the previous ones.

Holmgren's¹ method is easier and quicker of application, but does not allow of grading different degrees of color-blindness with so near approach to accuracy. It is, however, apparently all-sufficient for practical work, and it offers, what is in some respects an advantage, the possibility of dispensing entirely with the employment of names of colors. A large number of knots of worsted, including a variety of shades of all the principal colors, are mixed together upon a tray, and a knot of the color on which it is desired to experiment is selected and placed a little on one side. Then the individual to be examined is asked to pick out and lay by the side of this pattern all the knots which most nearly resemble it in color. The manner in which the task is performed affords a ready means of judging of the amount of perfection of the color-sense of the subject.

¹ De la Cécité des Couleurs, etc. Paris. Masson.

Holmgren thus tested two thousand two hundred and twenty men of an infantry regiment, and found sixty, or 2.7 per cent., affected; twenty-nine wholly, thirty-one incompletely blind for red, green, or violet (?). He makes also a third class in which "the sense of color is feeble," but this class was not included in the above numbers. Later, he examined all the employees of a railroad line, two hundred and twenty-six persons, men and women, and found thirteen men affected, six completely blind for green, and seven incompletely blind.

So much interest in the matter was awakened in Sweden that examination of the employees of all railroads in the kingdom was ordered, but at the time Holmgren's *brochure* was written, — February, 1877, — though the examination was quite or nearly completed, the returns had not all been made. A general examination of all the sailors in the Swedish navy had also been ordered.

Causation of Glaucoma. — At the last meeting of the Ophthalmological Society at Heidelberg, Pagenstecher¹ presented a number of specimens of glaucomatous eyes in illustration of the following conclusions which he had drawn from their anatomical investigation: (1.) There are forms of glaucoma in which there is no closure of the canal of Fontana. (2.) Closure or obliteration of the canal of Fontana does not of itself alone lead to glaucoma. (3.) In consequence of the glaucomatous process, provided it has lasted some time, iris and ciliary body undergo very considerable changes in far the greater number of cases, if not in all. The periphery of the iris is by the increased intraocular pressure brought into contact with the posterior surface of the iris and may become united to it; the iris thus assumes a position farther forward; the ciliary body and processes may be drawn forward, in a few cases also inward, or pressed backward, this being largely dependent on the position of the lens. Pagenstecher found in all his cases of acute glaucoma that the ciliary body was drawn forward, but does not assert that this is necessarily always the case.

But though it is demonstrated that glaucoma may arise without closure of the canal of Fontana, and that glaucoma need not occur when closure of this canal exists, the question remains whether the closure has any influence on the glaucomatous process. Pagenstecher believes that the closure does exert an influence, — that it acts to increase the intensity of the glaucomatous symptoms; that in many cases a closure of Fontana's canal by the peripheral portion of the iris, which is produced, often suddenly, by an increased intraocular pressure, blocking as it does the outflow of lymph, may in turn excite to the occurrence of a glaucomatous outbreak. The theory of Knies,² which regards the gluing of the periphery of the iris to the cornea as the consequence of a circumscribed inflammation of the tissues surrounding the canal of

¹ Bericht ueber die sechste Versammlung der Ophthalmologischen Gesellschaft.

² See JOURNAL of May 10, 1877, page 551.

Schlemm, and looks upon this inflammation as the cause of the glaucomatous symptoms, is correct in certain cases. In most cases of glaucoma, however, the outer portion of the iris is primarily forced into contact with the cornea by increased intraocular pressure, and only at a later period does it become firmly attached.

In the discussion which followed Pagenstecher's communication, Stilling stated that he had been led by consideration of the opinions expressed as to the excitation of glaucoma by stoppage of the anterior lymph channels to think that the posterior lymph channels had not received the attention they deserved. Leber's investigations had shown that the anterior chamber stood in no connection with the vitreous. It appeared, therefore, there must be a way of exit for the fluids circulating in the vitreous, and it seemed natural to regard the central canal of the vitreous as such. He had sought then to observe the effect of ligating the opticus and the lymph space between its sheaths, and by this means had succeeded, in rabbits, in causing a very greatly increased intraocular pressure. It appeared to him that in future two great groups of glaucoma must be distinguished: a glaucoma anticum, dependent on closure of the anterior lymph channels, the clinical character resembling that of iritis serosa or glaucoma with extended corneal cicatrices; and a glaucoma posticum, depending on closure of posterior lymph channels, those in the arachnoid sheath of the opticus, determined by some pathological process in their vicinity.

The Cause of Disturbance of Vision in Contusions of the Globe. — Berlin¹ refers again to a class of cases which he first described in 1873,² and examples of which he has repeatedly observed since. In these cases, following a blow on the eye, there is moderate decrease of vision without contraction of the field, episcleral congestion, and imperfect or irregular response of the iris to atropine. In most of the cases a grayish opacity of portions of the retina begins shortly after the injury, reaches its height in twenty-four to thirty-six hours, and has again disappeared in two to three days. In his former paper Berlin referred the disturbance of vision to irregular astigmatism of the lens, the indirect effect of the blow, and held that it was not at all dependent on the retinal opacity. These opinions were based on the facts that the same form and degree of disturbance of vision sometimes occurred without opacity of the retina, that the vision sometimes began to improve while the retinal opacity was still increasing, that the circumcorneal congestion and behavior of the iris under atropine showed irritation of the ciliary nerves, and that return of vision was coincident with disappearance of the symptoms of this irritation; partly, also, on the anatomical changes observed in the anterior parts of the eye when experiments were made on rabbits.

¹ Bericht ueber die 10te Versammlung der Ophthalmologischen Gesellschaft, 1877.

² Klinische Monatsblätter für Augenheilkunde, page 42.

The author is now confirmed in his idea that the disturbance of vision is not dependent on the retina, since once he has seen opacity of the retina appear without any such disturbance. In a number of his later cases a measurable amount of myopia, which disappeared on recovery, pointed to spasm of the ciliary muscle. In some of these cases a demonstrable astigmatism encouraged the belief that the contraction of the muscle was irregular, and that a part of the loss of vision was due to irregular astigmatism. The nature of the injury to the eye also would make it probable that all parts of the ciliary muscle would not be equally affected.

The extravasation of a small amount of blood between the iris and the anterior surface of the lens is shown by experiment to offer another possible cause of astigmatism in cases of injury, and the assumption of such an accident offers a reasonable explanation of the conditions observed in a case reported by Aub.

Treatment of Paralysis of Ocular Muscles. — For the treatment of paralysis of the external ocular muscles Michel¹ recommends a new "orthopædic" method, based on the principle of passive motion. The conjunctiva is seized with forceps near the corneal edge and at a part corresponding to the insertion of the affected muscle; the globe is carried as far as possible in the direction in which the muscle should act, and then brought back again, and this to-and-fro movement kept up for some two minutes. The process is to be repeated daily. The pain is said to be little, the slight irritation of the conjunctiva, which follows, easily subdued by cold compresses. The immediate effect of such exercise is often astonishing, and though it afterward gradually diminishes, yet the progress is on the whole steady. The chief advantages of the method are elimination of the action of the antagonist muscle and shorter duration of treatment. By frequent passive approach of the two ends of the paralyzed muscle its power of contraction is believed to be increased, its nerves stimulated, and its nutrition preserved or increased.

Feuer² reports a case of oculo-motor paralysis of the right side successfully treated by subcutaneous injection of strychnia. The patient, a man of forty years, had acquired the paralysis seven years before, and been treated by electricity shortly after the access for some weeks without result. There was divergent strabismus and large pupil. Injections of strychnia, increasing from one twentieth to one seventh of a grain, were made for six weeks, and at the same time eserine was employed to contract the pupil. At the end of this time movement inward was nearly normal, movement upward and downward normal, vision improved from eighteen thirtieths to eighteen twentieths, and stereoscopic vision established.

¹ Klinische Monatsblätter für Augenheilkunde, xv. 373.

² Centralblatt für Augenheilkunde, February, 1878.

REPORT OF THE PROCEEDINGS OF THE BOSTON SOCIETY OF MEDICAL SCIENCES.

JAMES J. PUTNAM, M. D., SECRETARY.

TUESDAY, SEPTEMBER 25, 1877. — DR. BLAKE showed a specimen of raw cotton, short staple uplands, very carefully washed, which he said was admirably adapted for use as an absorbent in delicate surgical operations. So readily will it absorb water that a ball of it rolled up tight in the fingers and thrown into a basin will sink instantly to the bottom, whereas a similar ball made of long staple cotton even though it has been washed with equal care will float for a long time. This cotton is sold by Dennison & Co. of Milk Street. A similar but less good variety is used by the Red Cross Society, prepared under the direction of Dr. von Brun.

In reply to Dr. Amory Dr. Blake said he supposed the absorbent power of the cotton to be due partly to the fact that the tubes of the fibres are thoroughly washed out, partly to the closeness with which the latter are felted together, the spaces between them acting as capillaries.

DR. JEFFRIES referred to an observation which he had made while looking at the sunset a few days before, which had been unusually brilliant, the colors being disposed in parallel stripes. He had found that he could shut out all the colors, one after another, but the red with especial ease, by reducing gradually the aperture of the lids.

TUESDAY, OCTOBER 16, 1877. — DR. GARLAND read a paper upon the *dynamic conditions at work within the thorax*, with special reference to the case of pleural exudations. It was pointed out that as the lungs are elastic bodies, placed on the stretch, and inclosed within relatively firm walls, against which they are held by atmospheric pressure, the effect of the introduction of fluid into the pleural cavity must be simply to allow them to contract to a certain extent; compression being entirely out of the question until the elasticity of the lungs shall have ceased to act, which does not take place until the chest contains a large amount of fluid.

Portions of the fluid are drawn, or more properly forced, above the level of the rest at certain points where the lung retracts more strongly than elsewhere, and it is thus that the curved line of flatness described two years ago by Dr. Ellis is produced. The heart is not pushed over towards the opposite side of the chest, as is commonly maintained, by the weight of the fluid, but is drawn over by the contraction of the opposite lung, the influence of which is usually counteracted by the contrary pull of its fellow. It was also pointed out that when the amount of the effusion passes a certain limit, the lowest (back) part of the diaphragm is the first to bulge, tipping the spleen forward and downward with it; and, further, that when air instead of fluid is introduced the condition of affairs varies in certain definite respects from that described. The mode of production of friction sound and other points were discussed.

The paper was illustrated by casts of cocoa-butter and other substances ob-

tained by injecting them while liquid into the chests of dogs, both living and recently killed, and by experiments with rubber balloons inclosed in glass flasks.

The paper has been recently published as a monograph entitled *Pneumodynamica*.

The discussion of the paper being in order, Dr. Garland said, in reply to Dr. Dwight, that no new point was claimed to have been brought out by these experiments regarding the mode of reabsorption of the exudation. It is probably absorbed in the same manner as that which is constantly being secreted by the pleura in health.¹

In answer to Dr. Bowditch's question why, when the patient lies on his back, the fluid gravitates so little towards the dependent part of the chest, Dr. Garland showed, with the aid of the rubber balloon, etc., that the position of the fluid is determined very much more by the elastic forces at work in the lung than by its own weight, and that the shape of the lung is such that it contracts the most strongly from its base toward its root, whatever be the position of the patient. The weight of the fluid does, however, of course, modify the shape of the lung to some extent.

In answer to Dr. Wadsworth Dr. Garland said that the heart was displaced earlier in pneumothorax than in hydrothorax on account of the negative pressure produced by the water as compared with the air.

In reply to Dr. Edes Dr. Garland said that after the lower part of the lung had retracted so much that the lung as a whole no longer tended to contract more strongly upwards than to withdraw from the chest wall in other parts, the fluid would begin to collect between the lung and the chest wall at its upper part, but this would imply the existence of a considerable effusion.

In answer to Dr. Draper he said that the S curve of flatness retained its general form even though most of the fluid had been rapidly withdrawn.

DR. T. B. CURTIS asked how soon, in pneumothorax, the lung may begin to be compressed by the air, as indicated by the bulging of the intercostal spaces.

DR. GARLAND knew of no data from which to answer definitely, except that Rokitsky has estimated that the lung may contract to one half of its volume.

In answer to Dr. Warren he said that he had already tried in one case the experiment of puncturing the chest with a canula attached to a tube opening under water.

In answer to Dr. Oliver he said that the lung contracts in the direction of the larger bronchi, and most strongly along its longest axis.

Skin Pigment. — DR. BOWDITCH showed photographs illustrating a case of pretended sudden *disappearance and reappearance of pigment* in a negro, and read the following extract from a letter on the subject: —

"Mrs. Nelson was born a slave near Maysville, Ky., and could not give an exact account of age, dates, etc. She says she was black until an adult, at least, after which time, without any cause apparent to herself, she gradually became white, until nothing of the black remained except just about the eyes, as she says, like a pair of goggles.

¹ Vide experiments by Dybkowsky.

"Some years since she did a day's work in the hot sun, a thing to which she was wholly unaccustomed, and that night felt a pricking sensation, so that she rubbed her body with flour, and from this time the black began gradually to return, until she presented, as at present, her usual appearance. The white portion of the skin is lighter than that of many brunettes, while the blotches are the pure African shade. Her husband is black, and her daughter appears like a full-blooded negress."

DR. WHITE thought that this case should not go on record as authentic, unless supported by stronger evidence than that offered.

TUESDAY, NOVEMBER 20, 1877. — DR. EDES exhibited some *microscopic sections of the rabbit's kidney* to show the *action of the secreting epithelium* lining the convoluted tubes, as measured by its power to eliminate the sulphindigotate of soda when injected into the blood of the living animal, and also to show the changes produced by mercurial and phosphorous poisoning.

In the normal kidney, if the animal is killed within a short time, say one half or three fourths of an hour, after the injection, and the kidney immediately washed out with absolute alcohol, we find the epithelium of the convoluted tubes stained blue, the nuclei probably very deeply so, and in some places the calibre of the tube filled with masses of the precipitated pigment. The Malpighian corpuscles are unstained, although surrounded by blue tubes, and the straight tubes contain little or no pigment.

If death takes place at a later period, so that more time is given for the secretion to take place and the indigo to be washed downward, the indigo is found densely packed in the interior of the straight tubes, the urine also becoming deep blue.

If a ureter is tied the backward pressure of the urine prevents the descent of fluid from the Malpighian corpuscles, so that the pigment, although secreted by the epithelium, is not washed away, but remains for the most part in the interior of the convoluted tubes in the cortical portion of the kidney.

In the kidneys of animals poisoned with mercury the epithelium of the straight tubes becomes dark, irregular, and loosened from its place; calcareous degeneration takes place at the outer ends of the straight tubes. Such a kidney as this, although the visible alteration of the true secreting epithelium is but slight, secretes but very little of the indigo.

During life the urine from an animal thus poisoned is clear and acid (in the rabbit abnormal), and contains albumen and casts.

In a rabbit poisoned with phosphorus we find the calcareous degeneration, but also the well-known fatty degeneration, of both sets of tubes, except the lower portion of the large collecting tubes, in an extreme degree. The convoluted tubes may be almost completely cleared by the processes employed for making the section transparent and then appear normal. They are, however, as shown by the indigo test, able to secrete only a very small amount of pigment.

The urine contains large numbers of dark, granular casts, and is occasionally, though not invariably, albuminous.

A kidney, the vein of which was obstructed, showed casts in the tubes and evidences of inability to secrete indigo.

The first set of experiments, which are repetitions of some of those of Heidenbain,¹ are supposed to favor Bowman's theory of the secretion of the urine, namely, that the Malpighian corpuscles act merely as water filters, while the solid constituents (supposing them to be represented by the indigo) pass out by a process of true secretion through the epithelium of the convoluted tubes. The others were intended to determine how far an epithelial cell, which had undergone degeneration, but which still retained its shape and place so as to appear nearly normal under the action of solvents which clear up fat, was capable of secretion. It would seem from them that a cell may be almost destitute of functional activity and yet retain its place and form, and, with exception of more (phosphorus poisoning) or less (mercurial poisoning) granular degeneration, its usual appearance.

DR. DWIGHT asked why the nuclei in the cells of the convoluted tubes were stained by the indigo, while those of the straight tubes were not.

DR. EDES thought that this corresponded to the functional differences between the cells, but said that the nuclei in the straight tubes occasionally became colored to a less extent.

DR. BOWDITCH asked if those observations disproved the filtration theory of Ludwig, or if, rather, it might not be that the indigo as it filters through the Malpighian bodies fails to be deposited there because it is so dilute, and that the nuclei of the convoluted tubes takes up the coloring matter more readily because it is presented to them in a more concentrated form, after a portion of the water has been reabsorbed by the cells.

In response to this and further questions from Drs. Bowditch and Garland, DR. EDES said that these experiments did not absolutely disprove the theory of Ludwig, but that the staining is probably not due, however, to simple precipitation of the coloring matter as it passes through the cells, since in that case we should expect the cells to be colored as deeply as their nuclei, and also because a *gradual* concentration of the urine would not account for the marked contrast between the almost absolute freedom from color in the Malpighian tufts and the deep staining of the nuclei just below them.

DR. WEBBER suggested that if this salt of indigo can be given with perfect impunity to health, the idea might be entertained of using it to stain the kidneys of moribund patients, especially those with chronic nephritis, with a view to future examination.

In reply to Dr. Amory, DR. EDES said that the other organs were not stained by any means so deeply as the kidneys, the general hue of the tissue being a light blue, so slight as not to appear under the microscope, while the kidneys were almost black, like a couple of ripe plums.

Perception of Color. — MR. G. S. HALL read a paper upon this subject, of which the following is an abstract:—

The analogies which, according to the undulatory theory, we should expect might exist between the ultimate mechanical apparatus of the ear and the eye have never been established. If we take into account the greater minuteness of the waves of the light ether, the eye, so far as explored, responds to external stimuli with far less special mechanical adaptation than the ear. The focal

¹ Archiv für die gesammte Physiologie, Bd. ix.

distance between violet and red is six times the length of the longest cone, and every object is surrounded with diffractive fringes ten times the diameter of the base of one cone. If the ultimate fibres of the auditory nerve had been supposed to be directly sensitive only to the vibrations of the fluid of the labyrinth, and if the functions of the ductus cochlearis were undiscovered, the explanation of the sensation of hearing would be scarcely more satisfactory or complete than that of color-perception, according to the Young-Helmholtz theory, now is.

It is well known that if two parallel fibres of spider's web be brought very near together upon white ground the intermediate white line has a beaded, zigzag outline, if closely examined with one eye, due to the arrangement of the cones, like the cells in a honey-comb. Now, if the ultimate percipient elements be cones of three varieties of sensibility, one third sensitive to green, one third to red, etc., it follows that with green or red lines, on black ground, the beaded irregularity must be much greater than if all the cones were excited, as they would be by white lines of light. There is, however, no difference in the size of these curves, nor in the difficulty of recognizing them, whether the lines are white or green, red or violet. Hence if the cause assigned to this appearance be the true one it would seem that the hypothesis of three sets of cones must be abandoned.

If, then, we really reach the ultimate possible limit of surface perception so far as even to distinguish the action of separate cones, but yet do not approach any analysis of white light into its elementary colors, the only remaining hypothesis is that they are distinguished in different plains of the retina.

The correspondence between the diameters of the disks of the external cone and the wave lengths of light along the red end of the spectrum suggested sympathetic vibration. A series of problems in geometrical optics at once presented themselves. Could any single refractive surface so shorten the long interval of .434 mm. between red and violet rays, caused by the achromatism of the lens and humors, that each color could be focused upon its appropriate disk? Although the equations are not yet all solved,—yet they are perfectly solvable,—here, at least, there is no difficulty, although it may be a question whether any focusing whatever is required.

Artificial and the spectral colors were observed, singly and variously combined, and it was found that green and green-blue gave a momentary positive after-image, almost perfectly white, even when the intensity of the middle of the spectrum was reduced to the smallest perceivable limit. Now, if a series of disks on the end of the cones, like rattles on the tail of a snake, and arranged in spectral order, red being outermost, are agitated near the middle (green), the agitation might be communicated to either end of the cone spectrum, producing the impression of an admixture of white light, which the excitation of either end would not do; and thus the whiteness of the positive after-image might be explained.

Again, how, on the hypothesis of three sets of cones, shall we explain the fact that pressure, either mechanically applied or caused by retinal congestion, often causes pure-colored as well as white images?

If, however, the red disks are at the outer end of the cones, among the coarse

pigment cells of the choroid, and especially if the cone lengthens and shortens with every irritation, as has lately been argued, we should expect that the ends of the cones would be often injured or undeveloped, as indeed the microscopist sometimes finds them. So, too, color-blindness at the other end of the spectrum may have a variety of mechanical causes. The color-blindness of the equatorial tracts of the retina may be explained by a shortening or inclination of the cones. So, too, the curve, in the mixture chart, at green, has never been explained. Why does the mixture of any two tones of green cause such exceptional decrease in saturation, unless on account of the instability which the central position of the green disks would give them, and unless, in accordance with the law of acoustic sensibility in sonorous bodies, the green disks give sympathetic response to a greater variety of wave lengths than the red or violet, which we should expect from the abruptness with which the impression of green fades out after the stimulus ceases?

Passing to violet, it is argued that the retina must be directly sensitive to its own fluorescence. If it be in the anterior layers of the retina, why is it not perceived as well as the retinal vessels? If, on the other hand, the light green, which has been observed in a fresh retina under the stimulation of ultra violet rays, is due to a complementary activity of the green disks, then, of course, the mind perceives it directly in the lavender gray, which may seen by a sensitive eye among the most refrangible rays.

The discussion on Mr. Hall's paper being in order, DR. AMORY said that the subject interested him greatly, especially in view of certain observations which he had made showing the varying action of lights of different colors in photographing upon plates made sensitive in different ways.

DRS. WADSWORTH and JEFFRIES expressed their regret that they had not had an opportunity to study the paper more at length before discussing it.

In reply to a question from Dr. Jeffries, whether in using colored papers in his experiments he had taken into consideration that they are not pure spectral colors, MR. HALL said that he had not done so at first, but that he had afterwards; also, that he had not considered the question as to the compressibility or incompressibility of the substance between the disks.

In reply to Dr. Wadsworth, Mr. Hall said that in disease when the rods and cones were destroyed he had supposed that perception of distinctly colored light was lost.

DR. WEBBER showed a microscopic preparation of a *nerve cell from the spinal cord*, which the most careful examination with high powers, by himself and others, had shown to have *two distinct nuclei*. It came from one of the anterior cornu near its base, towards the anterior commissure, a part where the cells are usually few in number and of medium size. It was stated to be an almost unique specimen.

DR. BOLLES showed one of the *long bones from the leg of a horse*, representing a *spiral fracture* due to direct injury, the horse having been kicked by another just above the heel.

The horse had been able to walk home, when, about ten days after the accident, having been doing apparently well, a slight wrench caused complete fracture. The original spiral line could be distinctly seen, occupying one and one

eighth circumference of the bone. He said that Dr. Stickney had seen a case where the same thing had occurred, the secondary fracture, compelling the killing of the animal, taking place thirteen weeks after the original injury.

DR. WARREN referred at some length to Dr. Hodges' observations on this point, saying that he had never known this fracture to occur in man from direct violence, but always from some wrench or twist, and that they usually lead to amputation.

DR. BOLLES did not think it impossible that a wrench was, strictly speaking, the nature of the injury in this case. Supposing both horses to have been kicking at once, and considering the direction in which the force must have been applied, it is easy to conceive that the leg should have been virtually twisted by the blow and the muscular exertion of the injured animal combined.

A NEW SYSTEM OF MEDICINE.¹

THIS highly original work invites slight attention. Had it been published fifty years or more ago we should not have been surprised at its visionary modes of expression, which remind us somewhat of the writings of Descartes, VanHelmont, and others. That such a work is published now, when medical literature and knowledge teems with physiological and pathological facts, will occasion a fair amount of surprise if not discouragement at the inconsiderate mode in which Dr. Bose lays these all aside. The proof of the correctness of our criticism may be judged by the following quotations, which are a fair exhibition of the style of the work.

After describing what he means by cognizance and recognizance, which Dr. Bose apparently considers antagonistic, — for instance, "Every disease is a *cognizance* struggling with nature, that is *recognizance*," — he says in regard to vision (page 118): "When an object is painted on the retina . . . we cannot see until the mind and the rational image (?) come to a sort of collision through their impressions. In other words, an accordance of the mind to the discordance of the body to be seen is an essential condition of the act of seeing. The image formed in the eye is said to be naturally inverted, and that we see it erect by reason of habit. This explanation appears to us to be as fanciful as we believe it untrue." Again, in regard to smelling (page 120): "Females have naturally more acute powers of smell than males. This arises partly from the greater nervousness (?) of their delicate make, and partly from their constrained intercourse with society and nature."

(Page 129), "The feeling of hunger proceeds from the want of liquor sanguinis (*sic*) in the whole body, first made known to the ganglia, and afterward to the brain, through the medium of the afferent gastric and other nerves." We abstain from further quotations, not only on account of the danger of exciting ridicule, but also because it is discouraging to see an author so blinded by his own fantasies that we doubt whether he really means what he writes. We cannot see what especial help the practitioner of medicine will gain from reading this curious literary production.

¹ *A New System of Medicine entitled Recognizant Medicine, etc.* By BHOLANOTH BOSE M. D. Lond. etc., H. M. Indian Medical service. London: J. & A. Churchill. 1877.

RATIONAL THERAPEUTICS.¹

It is a matter of surprise that Dr. Bose can waste his energy in writing a work of this nature. We simply reproduce the table of contents, and call attention to the peculiarity of the words coined by the author:—

“Cell, Fibre, or Primitive Organic Force. Remedies thereof, namely, General or Cell Tonics. Bitubulo-Cell, or Organic Medicines. Tritubulo-Cell Medicines. Pertubulo-Cell, or Mental or Intellectual Medicines.”

We are not surprised that the Indian Medical office took no notice of Dr. Bose's suggestion that his special report on the virtues of bhaunt, a new drug, should be published, if that report were written in the same style as the two works which have been submitted to our criticism.

 THE POLLUTION OF STREAMS.

THE joint committee of our legislature on water supply and drainage have proposed a bill giving to the State Board of Health the general supervision of all rivers, streams, or ponds in the commonwealth which are or shall be used by any city or town as sources of water supply, together with the waters feeding the same. Individuals and corporations, *public or private*, are prohibited from discharging into any pond or stream (within fifteen miles above the source of supply) any human excrement, sewage, drainage, refuse, or polluting matter of such quality and amount as shall, either by itself or in connection with other matter, corrupt or impair the quality of the water for domestic use, or render it deleterious to health. The board of health may order any person or persons, or corporation, *public or private*, to cease and desist from the pollution of such waters, or to purify the polluting substance, under the general provisions which now apply with regard to noxious and offensive trades; that is, an application must be made to the board to exercise the power conferred upon them, all parties concerned must be notified, and a hearing must be held. It is a noticeable fact that cities and towns may be proceeded against under this bill, and that there is no standard of pollution defined, the board of health being judges as regards that point. The Concord, Connecticut, and Merrimac rivers are excepted from the restrictions imposed upon other streams.

The English Pollution of Streams Act went into operation last August, one year after its enactment. It prohibits² the pollution or obstruction of *all streams*: (1) by the solid refuse of any manufactory, manufacturing process, or quarry, or any rubbish or cinders, or any other waste, or any putrid solid matter; (2) by solid or liquid sewage matter; (3) by any poisonous, noxious, or polluting liquid from any factory or manufacturing process; or (4) by the solid matter from any mine in such quantities as prejudicially to interfere with the due flow of the stream, or by any poisonous, noxious, or polluting solid or liquid matter from any mine, other than water in the same condition as drained or raised from the mine. In determining whether or not an offense has been committed,

¹ *Principles of Rational Therapeutics*. By BHOLANOTH BOSE, M. D. Lond, etc. London: J. & A. Churchill. 1877.

² From a circular issued by the local government board, August 6, 1877.

a marked distinction is drawn between the cases in which the sewage is conveyed into the stream along channels the construction of which had not been commenced at the time of the passing of the act, and those in which it is so conveyed along channels then already existing or in process of construction. In the former cases it will be an offense against the act for any sanitary authority to cause or permit the discharge into *any stream* of any solid or liquid sewage matter; in the latter an offense will not be deemed to have been committed if it can be shown that the best practicable and available means are used to render the sewage harmless. Moreover, in this class of cases the important power has been given to the local government board of suspending, in any particular instance, for a limited period, the operation of this portion of the act beyond the twelve months allowed by the statute, provided that they are satisfied, after local inquiry, that further time ought to be granted to the sanitary authority for the purpose of enabling them to adopt the best practicable and available means for rendering the sewage harmless. Mr. Robert Rawlinson, C. B., and Dr. Angus Smith, F. R. S., have been appointed inspectors under the act, and they are authorized to grant certificates to the effect that the means used, in any particular case, for rendering harmless any sewage or poisonous, noxious, or polluting solid or liquid matter discharged into any stream are the best or only practicable or available means under the circumstances.

It may be noticed that the provisions of the English bill are very stringent indeed; if they can be enforced in a country which is almost controlled, in some points of legislation, by manufacturers, it is certain that no great harm can thereby come to so important an interest. The vigorous opposition with which they met all efforts to cleanse the rivers of Great Britain, ten years ago, has very largely disappeared under the influence of more knowledge, on their part, of all the circumstances of the case, and especially of the fact that it is really for their benefit to have pure streams, as well as for the advantage of people whose health is likely to be influenced by the filth-laden water or the poisoned air.

THE JOURNAL OF PHYSIOLOGY.

THE first number of this new periodical, which is now before us, presents in the variety and interest of its articles, an ample fulfillment of the promises made in the prospectus. This journal owes its origin to a conviction on the part of English physiologists that while morphology and physiology are very closely allied sciences, representing in fact merely two methods by which biological questions may be approached, yet practically the problems of the morphologist and the physiologist are still and must for a long time continue to be so distinct that separate organs of publication are essential to the best progress in these two branches of study.

The conductors of the journal welcome to its pages contributions covering a very wide range of subjects. Investigations in toxicology, pathology, and histology, if carried on by physiological methods, may here be appropriately presented. In the words of the prospectus, "A physiological truth remains

a physiological truth, and should therefore be recorded in a physiological journal, whether it be discovered by the help of a microscope, a test tube, or a galvanic battery."

The journal is edited by Prof. Michael Foster, of Trinity College, Cambridge, assisted in England by Professors Gamgee, Rutherford, and Sanderson, and in America by Professors Bowditch and Martin. It seems, therefore, likely to become the recognized organ of English-speaking physiologists.

It is to be published by Messrs. Macmillan as nearly simultaneously as possible in England and America.

This experiment of uniting medical sciences of both sides of the Atlantic in a medical periodical is, we believe, an original one, and we trust will be attended with the most gratifying results.

MEDICAL NOTES.

—The *Journal de Médecine et de Chirurgie pratiques* for March, 1878, reports that M. Peter in some cases of pulmonary phthisis has found the withdrawal of blood by means of wet cups or of leeches to be advantageous. The first effect of such a loss of blood was to cause pain to cease, then to make respiration more free, to promote sleep, and to improve the general condition of the patient. At the same time the local signs improved. The remedy is not suitable for all cases. It is necessary that the patient should be able to endure, without serious inconvenience, a moderate loss of blood, which will be easily compensated by the benefit which he will derive in point of his general health.

—M. Besnier in the same journal recommends as an application in acne of the face a preparation composed of sulphur suspended in an equal amount of camphorated alcohol. It is to be applied every night by means of a brush which has been dipped in the sulphur at the bottom of the flask. The alcohol evaporates and leaves a coating of sulphur which can be washed off in the morning.

—Among the numerous preparations which, in the shape of material for surgical dressings, have been placed in the market of late years we have seen no such neatly prepared article as Dennison's absorbent cotton. It is simply perfectly pure cotton, having been carefully and thoroughly cleansed from oil, resin, and all extraneous matter. When placed in water it sinks rapidly to the bottom of the vessel, and when applied to a wound it quickly absorbs all discharges. For dressing sinuses, as in fistula in ano, or in uterine applications or examinations it seems to be much preferable to ordinary cotton or lint. It has the advantage of being a very clean and attractive-looking article, and might prove valuable in antiseptic surgery.

—Prof. Frank H. Hamilton has been suggested as a proper person to be health officer to the port of New York. The *Louisville Medical News* remarks: "We wish him every success, but cannot help thinking that if he has made no further progress in a knowledge of hygiene than he has in the treatment of certain fractures, he will be found some time endeavoring to frighten off cholera with Chinese gongs."

— Prof. W. H. Thompson says that either capsicum, ginger, or other aromatics combined with quinia will diminish the amount required of the latter.

— Kunze treats epilepsy with curare. He uses a solution of seven grains of curare in seventy-five minims of water, adding two drops of muriatic acid. At intervals of about a week he injects hypodermically eight drops of this solution, and in cases in which convulsions had occurred for several years he obtained a complete cure after eight or ten injections.

— Professor von Wohl has been appointed to the chair in Dorpat recently vacated by Professor Bergmann, who has taken a position at Wurzburg. Dr. Orth, Virchow's assistant in the Pathological Institute in Berlin, has been chosen Ponfick's successor as professor in ordinary in Göttingen. Ponfick has been called to Breslau.

— Dr. Lieven, in the Petersburg *Med. Woch.*, says that when symptoms announce the coming of a furuncle the skin over its locality should be scraped with a small knife, so that a drop or two of blood may be pressed through the epidermis. After this procedure no boil will be developed. "This result," says the *Medical Times and Gazette*, "would seem to show that the affection originates in the uppermost layer of the corium, and perhaps in the capillaries of the papillæ, and not, as hitherto received, in the subcutaneous connective tissues with succeeding necrosis of the corium and epidermis."

— An interesting allusion to Dr. Beketow, the Russian lithotomist, may be found in the *Medical Examiner* for February 21st. It seems that Beketow has operated for stone two hundred and seventy-five times with but twelve deaths, a mortality of only 4.36. The lateral operation was used in the majority of these cases.

— According to the *Medical Examiner*, a woman in Coburg had injured her skin, and had allowed her colored stocking to remain in contact with the wound. Symptoms of poisoning appeared, and the woman died ten days later. In the opinion of the medical attendants the symptoms were due to absorption of aniline from the stocking.

— Virchow's recent address on the Freedom of Science in the Modern State, before the Conference of the German Association of Naturalists and Physicians, "has been hailed everywhere by thoughtful men as a salutary counterblast to the wild utterances and vain imaginings of some expositors of modern science, public opinion has been sobered, and scientific men feel themselves once more set free from the tyranny of dogmatism." The *Lancet*, in which we find the above, also gives a portion of Virchow's object in making the address, namely: "To utter an earnest protest against the attempts that are made to proclaim the problems of research as actual facts, the opinions of scientists as established science, and thereby set in a false light before the eyes of the less informed masses not merely the methods of science, but also its whole position in regard to the intellectual life of men and nations." The quotation is from Virchow's preface to the published address.

— In the London *Lancet* it is announced that the Spanish government has ordered the collection of statistics of leprosy. In a medical report, presented to the governor of Valentia, it is stated that that province contains forty-five lepers; but it appears to be difficult to obtain precise information, the disease being concealed or disguised under a variety of names.

LETTER FROM PHILADELPHIA.

MR. EDITOR, — Commencement week is over, and our medical tributaries of the Pierian spring, having experienced their annual overflow, are quietly settling down again into their accustomed channels, and the tide is already sensibly flowing in the spring course, in the direction of the term of 1878-79. The graduation exercises passed off this year very much as usual, the Commencement of the Jefferson Medical College being held at noon on March 12th, and that of the University of Pennsylvania on the 15th, the former graduating two hundred and three, the latter one hundred and twenty-seven, students. Both were held, as has been the custom for the last ten or twelve years, at our Academy of Music, which, although one of the largest buildings of the kind in the country, is on these occasions always filled with a most select and appreciative audience, whose sympathy and interest are well shown by the profusion of floral offerings and the frequent applause. The valedictory addresses were delivered by Prof. Ellerslie Wallace and by Prof. Wm. Goodell.

As a means to an end, the arrangement of these exercises is admirably adapted to bring into appropriate prominence the æsthetic features of the entertainment. A fine orchestral concert is given during the hour preceding the appearance of the students and the commencement of the collegiate ceremonies proper, and also during the pauses between the different stages of the proceedings.

Prof. D. S. Connor, of Cincinnati, the orator of the Alumni Association of Jefferson College this year, was honored with a complimentary dinner by the association on the 12th, at which Professor Gross presided with his accustomed genial grace and spirit. The banquet was very select and enjoyable, the proceedings being enlivened by addresses from Professor Gross, the president of the association, Professors Connor, R. E. Rodgers, and Wm. H. Pancoast, and Drs. Hewson, Brinton, and others.

The University of Pennsylvania, following Harvard, has added a dental department recently to the institution, Professors Edwin S. Darby and C. J. Essig having withdrawn from the Pennsylvania College of Dental Surgery to accept the chairs of dental pathology and mechanical dentistry, respectively, at the University. Professor Tyson has also withdrawn from the Dental College, and the trustees have chosen Messrs. Pierce, Wilbur F. Litch, and Henry C. Chapman, M. D., to fill these vacancies. It is said that the prospective dental students of the University are expected to attend the lectures of the regular medical course in anatomy, physiology, pathology, and materia medica, and also those of Professors Darby and Essig, just referred to. This will make the third first-class dental school in Philadelphia, and its prospects are pronounced to be very promising.

A recent murder in this locality is destined to be *un cas célèbre* in insurance circles. An elderly music-typographer of this city, named John M. Armstrong, was induced to go to Camden on the evening of January 23d of this year, and there was brutally murdered in the streets by means of a hatchet and hammer that were afterward found on the pavement. As the initials cut upon the

handles of the tools corresponded with those of a Mr. Davis living in the neighborhood, who unfortunately owed Armstrong money, he was promptly secured. The detectives subsequently arrested a man named Benjamin Hunter, of Philadelphia, who it was found held insurance policies on the life of Armstrong to the amount of \$26,000, and who had been instrumental in enticing him to Camden on the fatal night. It was also ascertained that he had an accomplice, and upon arresting his former apprentice, Thomas Grahame, twenty-six years of age, a man of family but of dissolute habits, the latter yesterday made an explicit confession, which apparently explains every detail of the crime. Grahame states that Hunter came to him in December last, and said that Armstrong must be killed, and offered to pay him five hundred dollars for his murder, the plan being so arranged that the deed should be committed while Hunter was away from the city. When he subsequently returned and found that Grahame had failed him, he appeared to lose his caution, and now took a more prominent part in the proceeding. It is said that he even accompanied his victim on the night in question, having arranged that Grahame should waylay them at a certain place, and having also provided him with the weapon cut with the appropriate initials. Grahame says that he struck the man with the hammer and then ran away, and Hunter afterward finished him. They both returned to the city and continued their daily duties, satisfied that the law would wreak its vengeance upon Davis, an innocent man. Altogether this is one of the most diabolical and cold-blooded plots that could be imagined, and in some features recalls the paid bravo of the Middle Ages. Hunter has been a successful business man, and is now said to own \$50,000, although the only apparent motive for the deed was the desire for gain. Armstrong owed him some \$5000 on a former business transaction, which furnished him the excuse for insuring his life to such an unusual amount. His victim had also been his opposite neighbor for a number of years, and had taught his children music, their families being intimate.

To turn from these repulsive details to a more congenial theme, we may say that, among the many applications of the new telephone, its possible utility in auscultation, especially for class demonstration of disorders of the chest, has doubtless occurred to many clinical teachers. Professor DaCosta made a preliminary trial last month, at the Pennsylvania Hospital, of a Bell's telephone constructed by Dr. W. B. Hopkins, a former resident. It was tested by cases of cardiac murmurs and different varieties of respiration, and while the results obtained were not fully satisfactory, it was believed to be demonstrated that a slight modification in the construction of the instrument, enabling it to respond to more delicate impulses, would fit it for the purpose, and make it an almost indispensable adjunct to the clinical amphitheatre.

Professor DaCosta has been successfully treating a case of chlorosis and irritable stomach with hypodermic injections of dialyzed iron, with excellent effect. He urges its trial in pernicious anæmia, gastric ulcer, spanæmia from hæmorrhage or other causes, not to take the place of the ordinary method of administration, but usually to supplement it, except in those instances where it is impossible to give iron by the mouth.¹

¹ See page 370 of the current volume of the JOURNAL.

For a full report of this case and the clinical lecture upon the subject the reader is referred to the original in the *Philadelphia Medical and Surgical Reporter* for March 16, 1878, page 209.

We are reluctantly compelled to chronicle another death from chloroform, administered for dental purposes, by Dr. Winslow, in this city on the 20th inst. The lady, Mrs. Wm. H. Neely, thirty-four years of age, from Montgomery County, Pa., came to Philadelphia for the purpose of having teeth extracted. Having been for some time in delicate health, she was afraid to take chloroform, but upon the dentist's assuring her that there was no danger she finally consented. He says that he only gave it for a minute or so; he then became frightened and sent out for a neighboring physician, who pronounced the lady to be dead. As the newspaper report states that she died in the chair, the chloroform was probably administered in the sitting posture. At the post-mortem examination a fatty heart was discovered. It is stated that the coroner's physician does not attach any blame to Dr. Winslow! Let it be hoped that the coroner's jury will not piously (or blasphemously) attribute the result to Divine Providence, and bring in a verdict of "death from natural causes" or "misadventure;" and thus enable dentists to continue, as heretofore, to give chloroform in their business, without any knowledge of the state of the heart or due regard for the posture of the patient. Innocent people, of course, will continue to die, but if they desire to be chloroformed, can the dentist be held accountable for any "accidents," at least so long as our coroner's juries are willing fully to exonerate him?

Later. The following is the very just and satisfactory verdict of the coroner's jury:—

"The jury find that Elizabeth Neely came to her death March 20, 1878, at No. 224 North Tenth Street, by chloroform administered by H. G. Winslow, M. D., and we find the said Dr. Winslow guilty of criminal ignorance in administering so powerful a remedy, not having made any examination of his patient."

Winslow was really a graduate in medicine, and five out of the six jurymen were also regular graduates.

Before closing, I would call your attention to two paragraphs which I cut from our *Evening Telegraph* of the 30th ult. The first is in regard to the administration of chloroform by dentists, is the closing paragraph of the presentment of the grand jury to the court for the month of March, and is in reference to the case reported in my last letter. It is likewise the expression of a non-professional opinion. "They further submit that the every-day and familiar use of anesthetics, particularly of chloroform, is reprehensible and dangerous in the highest degree. The recent fatal termination of the administration of chloroform in a dentist's office calls for more than passing notice. The rapidity and completeness with which this drug produces anesthesia bring it into general use, although the transition from sleep to death is so imperceptible that a moment's inattention on the part of the administrator may prove fatal. It is recommended that the use of chloroform at least be restricted by law to those cases where a practicing physician is called to the aid of the administrator, who may be thus enabled to clear himself from a charge of carelessness and incompetence, if not of murder."

Dr. Wm. B. Atkinson announces that the work that he has been for some-time editing, entitled *The Physicians and Surgeons of the United States*, in one royal octavo volume, is finally completed, and is now being delivered to subscribers. It contains short sketches, principally antobiographies of about seven hundred of the prominent living medical men of this country, and one hundred and fifty full-page portraits on steel. It constitutes a valuable contribution to contemporaneous medical history, and will probably meet with a flattering reception.

A number of our leading physicians have recently memorialized city councils on the subject of our drainage system, which is confessedly inadequate and imperfect, and which is considered to be connected directly with our recent outbreak of scarlet fever and diphtheria. What effect this may ultimately have it is impossible to predicate, but we are not so sanguine as to anticipate any radical changes for some time to come.

PHILADELPHIA, March 22, 1878.

COMPARATIVE MORTALITY-RATES.

	Estimated Population, July 1, 1878.	Deaths during week ending March 30, 1878.	Annual Death-Rates per 1000 living.		
			For the Week.	For the Year 1877.	Mean of ten Years, '68-77.
New York.	1,093,171	530	25.21	24.32	28.71
Philadelphia.	876,118	313	18.58	18.80	21.54
Brooklyn.	549,438			21.51	25.50
Chicago.	460,000	114	12.89	17.83	22.39
Boston.	375,476	143	19.80	20.10	24.34
Providence.	100,000	36	18.72	18.81	19.20
Lowell.	55,798	21	19.62	19.09	22.50
Worcester.	54,937	18	17.05	14.07	22.30
Cambridge.	53,547	19	18.44	18.69	20.83
Fall River.	53,207	14	13.68	21.35	24.96
Lynn.	35,528	16	23.42	20.42	19.67
Springfield.	33,981	8	12.25	16.04	19.77
Salem.	27,140	8	15.33	20.28	21.15

BOSTON SOCIETY FOR MEDICAL OBSERVATION.—At a meeting of this society, to be held on Monday evening, April 15th, at eight o'clock, at its rooms, 36 Temple Place, Dr. F. C. Shattuck will read a paper on *An Outbreak of Diphtheria and Erysipelas in a Small Hospital*.

MR. EDITOR.—In your JOURNAL for March 21, 1878, page 383, I notice among the Notes of Practice and Peculiarities of Practice from Hospital of the University of Pennsylvania a prescription for pills for amenorrhœa as something new. This prescription is the same as given in Niemeyer's Text-Book of Practical Medicine, and has been used by the physicians in this vicinity for quite a number of years with excellent success.

I am, sir, very truly yours,

E. H. PETTINGILL.

SAXTON'S RIVER, VT.

DR. GEORGE M. BEARD, of New York, is desirous to obtain facts relating to the symptoms and history of "writer's cramp." He has prepared a circular containing a list of questions, which will be forwarded on application by those who desire to afford him information on this subject.